

**Notice of Allowability**

Application No.

10/563,524

Examiner

Edward R. Cosimano

Applicant(s)

HALL ET AL.

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the papers filed on 05 January 2006 and 06 June 2006.
2. ☒ The allowed claim(s) is/are 1-27.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All   b) ☐ Some\*   c) ☐ None   of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date 20060105
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

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1. The Oath/Declaration filed on 06 June 2006 and the Abstract as filed on 05 January 2006 are acceptable to the examiner.
2. Applicant's claim for the benefit of an earlier filing date pursuant to 35 U.S.C. 120/371 is acknowledged.
3. The examiner has considered the prior art cited in the base applications.
4. The following comments have been made in reference to the specification, drawings and claims filed on 05 January 2006.
5. The set of drawings containing figures 1, 2A, 2B, 3, 4, 6, 11, 12A, 12B, 13 & 14 as presented in the set of drawings filed on 05 January 2006 are acceptable to the examiner.
6. The drawings filed on 05 January 2006 are objected to because:

A) the drawings fail to comply with 37 CFR 1.84(p)(5) because they include the following reference legend not mentioned in the description, note reference legend 508 which has not been mentioned in the written description of figure 5 located in the paragraph between page 16, line 19, and page 19, line 27, "FIG. 5 shows ... with a critical threshold value."

B) the drawings fail to comply with 37 CFR 1.84(p)(5) because they include the following reference legends not mentioned in the description, note reference legends 700, 706, 708, 710, 712, 714, 718, 720, 722, 724, 800, 802, 804, 806, 808, 810, 814, 816, 818, 820, 822, 900, 902, 1002, 1004, 1010 & 1012 which have not been mentioned in the written description of figures 7, 8, 9 & 10 between page 21 and page 24.

6.1 Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet"

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pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

7. The disclosure is objected to because of the following informalities:

A) errors and/or inconsistencies between the drawings filed on 05 January 2006 and the written description have been noted:

(1) since the drawings lack figures 12a, 12b, & B and contain a figures 2A, 2B, 12A & 12B, from the context of the paragraph located at (a) page 2, lines 16-30, the reference to "FIGS. 12A and B" should be --FIGS. 12A and 12B--, (b) from the context of the paragraph located at page 5, lines 27-29, "FIG. 2A, B" should be --FIG. 2A, 2B--, (c) from the context of the paragraph located at page 6, lines 15-18, "FIG. 12A, B" should be --FIG. 12A, 12B--, (d) page 15, lines 6-17, the reference to "FIGS. 2A and B" should be --FIGS. 2A and 2B--, note the proposed change below.

(2) if applicant chooses not to delete reference legend 508 from figure 5, note above, then the specification fails to comply with 37 CFR 1.84(p)(5) because the specification does not include an explicit reference to this reference legend in the description of figure 5 located in the paragraph between page 16, line 19, and page 19, line 27, "FIG. 5 shows ... with a critical threshold value."

(3) if applicant chooses not to delete reference legends 700, 706, 708, 710, 712, 714, 718, 720, 722, 724, 800, 802, 804, 806, 808, 810, 814, 816, 818, 820, 822, 900, 902, 1002, 1004, 1010 & 1012 from figures 7, 8, 9 & 10, note above, then the specification fails to comply with 37 CFR 1.84(p)(5) because the specification does not include an explicit reference to these reference legends in the description of figures 7, 8, 9 & 10 located in the paragraphs between page 21 and page 24.

B) the disclosure lacks a statement of --We claim:--, as required by Office policy as set forth in MPEP 608.01(m).

7.1 Appropriate correction is required.

8. EXAMINER'S AMENDMENT

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8.1 An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

IN THE SPECIFICATION

(1) at page 2, lines 16-30, replace the current paragraph with:

JP 5-133831 discloses a WVA which identifies a pronounced low frequency resonance which can be measured when the vehicle velocity is low. Typically, the corresponding resonance frequency lies in the range of about 30 to 50 Hz. When the vehicle velocity increases to a high velocity range, the low resonance peak loses intensity. In this velocity range the JP 7-21723 and EP 0925960 further identify a high frequency resonance which is suitable for the tire pressure estimation. The frequency of this resonance is in the range of about 60 to 90 Hz. However, for too high vehicle velocities, it becomes increasingly difficult to use vibrational analysis for tire pressure estimation. FIGS. 12A and 12B show two power spectra of the rotational velocities which correspond to a low and a high vehicle speed, respectively. The low (FIG. 12A) and high (FIG. 12B) resonance peaks can easily be identified.

(2) at page 5, lines 27-29, replace the current paragraph with:

FIG. 2A, 2B show two contour plots of the pressure indication value  $\eta_1$  for two different sets of tuning parameters;

(3) at page 6, lines 15-18, replace the current paragraph with:

FIGS. 12A, 12B show two power spectra of the rotational velocities which correspond to a low and a high vehicle speed, respectively, according to the prior art;

(4) at page 15, lines 6-17, replace the current paragraph with:

To illustrate this effect, contour plots of the pressure indication value  $\eta_1$  for two different sets of tuning parameters  $\sigma_1$  and  $\sigma_2$  are shown in FIGS. 2A and 2B. For the plot shown in FIG. 2A, the parameters were chosen to be small ( $\sigma_1 = 0$ ,  $\sigma_2 = 0.4$ ) in order to introduce merely a small penalizing effect. In this case, the gradients in direction of the axes (distance of the contour lines near the axes), where WVA and WRA disagree with each other, is similar to the gradient along the diagonal  $\Delta f_1 / \sigma_f = \Delta r_1 / \sigma_r$ , where WVA

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and WRA agree with each other. For the plot shown in FIG. 2B, the parameters were chosen to be large ( $\sigma_1 = 0.5$ ,  $\sigma_2 = 1.0$ ) in order to introduce a strong penalizing effect. This renders the gradient along the diagonal steeper than the gradient in direction of the axes.

(5) at page 17, fourth line from the end of the page, before "from" insert --in step 508--.

(6) at page 21, before the first full paragraph, insert::

In regard to the following description of FIGS. 7, 8, 9 and 10, it is noted that the features of the invention designated as steps 700, 706, 708, 710, 712, 714, 718, 720, 722, 724, 800, 802, 804, 806, 808, 810, 814, 816, 818, 820, 822, 900, 902, 1002, 1004, 1010 & 1012 correspond to the same steps of figures 5 & 6 but with different step numbers starting with the designation of the figure.

8.1.1 The amendments correct minor oversight errors in the disclosure.

9. The following is a statement of reasons for the indication of allowable subject matter:

A) the prior art, for example:

(1) either Lehman (2,417,940) or Sprigg (2,727,221) or Ross et al (3,786,413) or Derbyshire et al (6,271,748) or Saheki et al (2003/0156022 or 6,963,274) discloses a machine/process that provides the useful and beneficial function of detecting a pressure drop in any one or more of the individual tires of a vehicle and then indicating that a potentially hazardous condition is occurring in regard to the tire or tires to the operator of the vehicle. Where:

(a) in Ross et al (3,786,413) the wheel radius is considered by the disclosed machine/process;

(b) in either Derbyshire et al (6,271,748) or Saheki et al (2003/0156022 or 6,963,274) the disclosed machine/process considers both the measured pressure and the measured temperature of the tire, and in Saheki et al (2003/0156022 or 6,963,274) the disclosed machine/process further considers the measured speed of the vehicle.

(2) Antonson (2,943,663) discloses that the inflation pressure of a tire will affect the performance of the tire.

(3) Brooke et al (4,630,470) discloses a machine/process in which an external object is caused to vibrate by a tire where the tire size, vehicle speed and tire pressure will affect the vibration frequency of the object.

(4) either Taguchi (JP 05-133831 A) or Takai (JP 07-21723 A) or Naito et al (EP 0 925 960 A2) or Gustafsson et al (WO 01/87674 A1 or 2003/0172728) have been cited and discussed by the applicant within the disclosure.

(5) Ohashi et al (JP 09-2031 A) discloses a machine/process in which a wheel speed sensor is used to estimate the tire pressure by using detected vibrations in the sensor signal at low speed and an estimated of the wheel's radius based on the sensor signal at high speeds.

B) however, the prior art does not fairly teach or suggest in regard to claims 1, 26 & 27 a process in claim 1, a machine in claim 26, and a manufacture/article in claim 27

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that provides the useful and beneficial function of detecting an deviation in tire pressure by providing structures in claims 26 & 27 and actions in claim 1 that perform the functions of detecting a deviation in tire pressure based on a combination of a measurement of both the vibrations caused by the tire and the radius of the tire. Claims 2-25 which depend from claim 1 are allowable over the prior art for the same reason.

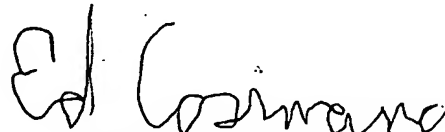
10. Since publication become unavailable, applicant is required to submit copies of the prior art mentioned at page 22, lines 1-4, "[1] Maybeck, Peter S.: Stochastic models, estimation, and control, Mathematics in Science and Engineering, Volume 141, 1979; [2] Zarchan, Paul and Musoff, Howard: Fundamentals of Kalman Filtering: A Practical Approach, 2000, AIAA".

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edward R. Cosimano whose telephone number is 571-272-0571. The examiner can normally be reached on 571-272-0571 from 7:30am to 4:00pm (Eastern time).

11.1 If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow, can be reached on 571-272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

11.2 Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ERC  
04/02/2007

  
**Edward Cosimano**  
**Primary Examiner**